

**PATENT**

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**Abstract of the Disclosure**

A method of measuring a concentration of conductive species in an aqueous system is disclosed. In one embodiment, the method comprises providing an electrochemical cell wherein the electrochemical cell has a cell resistance that varies with a concentration of conductive species and determining a relationship between the cell resistance of the electrochemical cell and the concentration of conductive species. The method further comprises measuring one or more electrochemical parameters of the electrochemical cell and determining a test concentration of conductive species based upon the one or more measured electrochemical parameters. Also disclosed is a system for electroplating a material layer on a substrate. The system comprises an electroplating apparatus for electroplating a material layer on a substrate, an electrochemical sensing device capable of measuring a cell resistance of the electroplating bath and one or more material storage reservoirs capable of delivering one or more materials to the electrochemical plating bath.